

Math 0110 Exam Review 2
Monday, Oct. 26, 6-8 pm in Physics 114

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Sections: 3.2-3.5, 5.1-5.8, 6.1-6.2

1. Find the Domain and range of each relation. Determine which are functions.

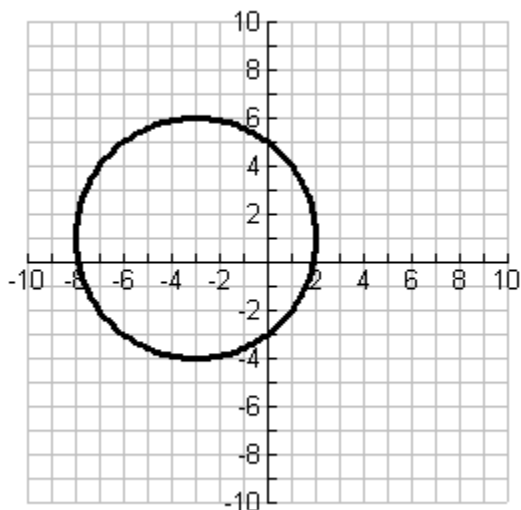
a. $\{(1,2), (3,2), (5,5)\}$

b. $\{(1,2), (3,4), (1,6)\}$

c. $x = y^2$

d. $y = |x - 3|$

2. a. Find the Domain and Range for the relation in the graph:



b. Is the relation, pictured above, a function?

3. Write the equation using function notation: $5x - 3y = 6$

4. Express $f(10) = -4$ as an ordered pair.

5. Given $g(x) = 3x^2 - 6$, find :

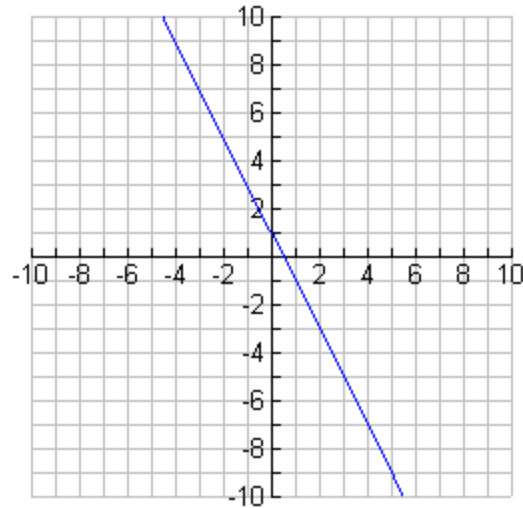
a. $g(-2)$

b. x , if $g(x) = -6$

6. The graph shows the function $h(x)$

a. Use the graph to find $h(1)$

b. Find x so that $h(x) = 5$



7. Find the slope of the line through $(-3, -4)$ and $(-6, 5)$.

8. Find the slope of the line $3x - 2y = 18$

9. Determine the coordinates of the x-intercept and the y-intercept of the line $5x - 3y = 15$

10. a. Find the equation of the horizontal line through the point $(3, 4)$.

b. Find the slope of the vertical line through the point $(2, 7)$.

11. Find the equation of the line passing through the points $(-5, -1)$ and $(2, -3)$.

Express in standard form: $Ax + By = C$

12. Find the equation of the line passing through the points $(-3, 2)$ and $(-3, 5)$.

13. Find the equation of the line passing through the point $(2, -1)$ and perpendicular to $9x - 3y = 4$.

Express in slope-intercept form: $y = mx + b$

14. Find the equation of the line through the point $(3, -2)$ and parallel to $y - 7 = 0$.

15. a. Determine whether $(0, -12)$ and $(1, 9)$ are ordered pair solutions to the linear equation $3x - y = 12$

b. How many ordered pair solutions does the linear equation $3x - y = 12$ have?

16. Perform the indicated operation and express the answer in scientific notation: $\frac{(0.00003)(500)}{30}$

17. Express in scientific notation: 23.7 million dollars.

18. Simplify. Write the answer using positive exponents only: $\frac{2^{-3}x^2y^{-1}}{5^{-2}x^7y^{-5}}$
19. Simplify. Write the answer using positive exponents only: $(5xyz)^{-4}(x^{-2})^{-3}$
20. Simplify: $x^{4a}(3x^{5a})^3$
21. Evaluate: $-(14)^0 + (-14)^0 + (1)^{14}$
22. Simplify: $(ab^0c^{-2})^{-3}$
23. Evaluate: $\left(\frac{26 \times 315}{543}\right)^0$
24. Given $Q(x) = 4x^2 - 6x + 3$ and $R(x) = 5x^2 - 7$, find $2[Q(x)] - R(x)$. Express the answer as a simplified polynomial in decreasing powers of x.
25. Multiply out and simplify: $(4x^2 - 3)^2$
26. Simplify the following expression: $(4x^2 - 6xy + 9y^2) - (8x^2 - 6xy - y^2)$
27. Multiply: $-6x(4x^2 - 6x + 1)$
28. Multiply using special products:
- a. $(x + 3y)(x - 3y)$ b. $(4x + 9)^2$ c. $(x^2 + 1)(x + 1)(x - 1)$
29. Factor completely: $16x^7y^5 - 12x^4y^3 - 36x^2y$
30. Factor completely: a. $9a^3b - 25ab$ b. $(x - 2)^2 - 25$ c. $y^2 + 25$ d. $a^4 - 16$
31. Factor completely: a. $2x^4 + 54x$ b. $27x^3 - 64y^3$
32. Factor completely: a. $w^2 + 9w - 10$ b. $x^2 - 6xy - 27y^2$
33. Factor completely: a. $12x^2 - 11x + 2$ b. $12a^2 - 14a - 20$ c. $2y^2 - 13y + 6$
34. Factor completely: $9m^2 - 24m + 16$

35. Solve the equation: $t(2t - 3) = 2$

36. Multiple choice format: Solve the equation: $3d^2 + \frac{d}{2} = \frac{1}{2}$. The sum of the solutions is:

- a. -1 b. 0 c. -1/6 d. 5/6

37. Multiple choice format: Solve the equation: $y^3 + 4y^2 = 9y + 36$. The product of the solutions is: a. 12 b. 36 c. -36 d. -12

38. An object is thrown upward off the top of a building. The height $h(t)$ in feet of the object after t seconds is given by: $h(t) = -16t^2 + 80t + 576$

- a. Determine how long before the object hits the ground.
 b. Determine when the object is 640 feet above the ground.

39. Find all positive integers b such that $x^2 + bx + 14$ is factorable.

40. One leg of a right triangle is 4 inches shorter than the other leg. The hypotenuse is 20 inches long. Set up an equation that you could solve to find the length of the shorter leg.

41. Find the domain of $f(x) = \frac{x^2 + 10x + 25}{x^2 + 8x + 15}$

42. Divide and simplify the answer: $\frac{6a^2b^2}{a^2 - 4} \div \frac{3ab^2}{a - 2}$

43. Perform the operations and write the answer in lowest terms: $\frac{9x + 2}{3x^2 - 2x - 8} + \frac{7}{3x^2 + x - 4}$

44. Perform the operations and write the answer in lowest terms: $\left(\frac{x - 2}{x - 3} - \frac{2}{x + 3}\right) \div \frac{x - 1}{x + 3}$

Key:

1. (a). Domain = {1,3,5} Range = {2,5} Function (b). Dom. = {1,3} Range = {2,4,6} not a function.
 (c). Dom = [0,∞), Range = (-∞,∞), not a function. (d). Dom = (-∞,∞), Range = [0,∞) Function
 2. (a) Dom = [-8,2] Range = [-4,6] (b). Not a function b/c it will not pass the vertical line test. 3. $f(x) = \frac{5}{3}x - 2$ 4. (10,-4) 5. (a) 6 (b) x=0

6. (a) -1 (b) x = -2 7. $m = -3$ 8. $m = \frac{3}{2}$ 9. (3,0) (0,-5) 10. (a) y = 4

(b). Slope undefined. 11. $2x + 7y = -17$ 12. $X = -3$ 13. $y = -\frac{1}{3}x - \frac{1}{3}$ 14. $y = -2$

15. (a) $(0, -12)$ is a solution (b) infinitely many 16. 5×10^{-4} 17. 2.37×10^7 dollars

18. $\frac{25y^4}{8x^5}$ 19. $\frac{x^2}{625y^4z^4}$ 20. $27x^{19a}$ 21. 1 22. $\frac{c^6}{a^3}$ 23. 1

24. $3x^2 - 12x + 13$ 25. $16x^4 - 24x^2 + 9$ 26. $-4x^2 + 10y^2$ 27. $-24x^3 + 36x^2 - 6x$

28. a. $x^2 - 9y^2$ b. $16x^2 + 72x + 81$ c. $x^4 - 1$

29. $4x^2y(4x^5y^4 - 3x^2y^2 - 9)$ 30. a. $ab(3a - 5)(3a + 5)$ b. $(x - 7)(x + 3)$ c. prime
d. $(a^2 + 4)(a - 2)(a + 2)$

31. a. $2x(x + 3)(x^2 - 3x + 9)$ b. $(3x - 4y)(9x^2 + 12xy + 16y^2)$ 32. a. $(w + 10)(w - 1)$

b. $(x - 9y)(x + 3y)$ 33. a. $(3x - 2)(4x - 1)$ b. $2(6a + 5)(a - 2)$ c. $(2y - 1)(y - 6)$

34. $(3m - 4)^2$

35. $t = -1/2$ or $t = 2$ 36. $d = \frac{1}{3}$ or $d = -\frac{1}{2}$, sum is c. 37. $y = 3, -3, \text{ or } -4$, product is b.

38. a. 9 seconds b. 1 second and 4 seconds 39. 15, 9 40. $x^2 + (x - 4)^2 = 20^2$

41. Domain: $\{x \mid x \text{ is a real number and } x \neq -5, -3\}$ $\frac{x+5}{x+3}$ 42. $\frac{2a}{a+2}$ 43. $\frac{3x-4}{(x-2)(x-1)}$ 44. $\frac{x}{x-3}$